

THE GENUS *UROCHLOA* (POACEAE: PANICEAE)  
IN TEXAS, INCLUDING ONE PREVIOUSLY  
UNREPORTED SPECIES FOR THE STATE

J.K. WIPFF

S.M. TRACY HERBARIUM

*Department of Rangeland Ecology and Management*  
*Texas A&M University*  
*College Station, TX 77843-2126, U.S.A.*

ROBERT I. LONARD

*Department of Biology*  
*University of Texas-Pan American*  
*1201 W. University Drive*  
*Edinburg, TX 78539, U.S.A.*

STANLEY D. JONES and STEPHAN L. HATCH

*S.M. Tracy Herbarium*  
*Department of Rangeland Ecology and Management*  
*Texas A&M University*  
*College Station, TX 77843-2126, U.S.A.*

ABSTRACT

*Urochloa* is represented in Texas by three species, *U. mosambicensis*, *U. panicoides*, and *U. reptans*. *Urochloa mosambicensis* is being reported new for Texas. *Urochloa panicoides* has recently been reported in the state and is listed in the Federal Noxious Weed Act. *Urochloa reptans* has been recognized in Texas and the U.S. as *Panicum reptans* or, more recently, *Brachiaria reptans*. A key to distinguish related genera, a key to the species of *Urochloa* in Texas, species descriptions, and their distribution in Texas are provided.

RESUMEN

*Urochloa* está representada en Texas por tres especies, *U. mosambicensis*, *U. panicoides* y *U. reptans*. *Urochloa mosambicensis* se cita como nueva para Texas. *Urochloa panicoides* ha sido citada recientemente en el estado y está catalogada en la Ley Federal de Plantas Nocivas (Federal Noxious Weed Act). *Urochloa reptans* ha sido reconocida en Texas y en el resto de los Estados Unidos como *Panicum reptans*, o más recientemente como *Brachiaria reptans*. Se ofrece una clave para identificar los géneros próximos, otra clave para las especies de *Urochloa* en Texas, así como descripciones de las especies y su distribución en Texas.

*Urochloa* P. Beauvois is native to the Old World tropics, mainly Africa, and consists of about 12 species (Clayton and Renvoize 1986). *Urochloa* has not previously been treated in any Texas manual (Correll and Johnston 1970, nor

Gould 1975). It is represented in Texas by three species, *U. mosambicensis* (Hackel) Dandy, *U. panicoides* P. Beauvois, and *U. reptans* (L.) Stapf. *Urochloa mosambicensis*, native to Africa, has recently been collected in Texas and is new for the state. All previous collections of this species from Texas were those from cultivated plots. *Urochloa panicoides*, native to Africa and India, has been reported from New Mexico (Hatch 1977), Mexico (McVaugh 1983) and recently from Texas (Hatch et al. 1990). This taxon is listed in the Federal Noxious Weed Act [7 CFR Part 360.200 (C)]. *Urochloa reptans*, native to tropical Asia, has been traditionally recognized by American authors in *Panicum* (Chase 1951, and Correll and Johnston 1970) or *Brachiaria* (Gould 1975). It has been reported from Florida to Texas (Chase 1951), Mexico (McVaugh 1983), south to Central America, Costa Rica (Pohl 1980), and northern South America (Judziewicz 1990).

*Urochloa* and *Brachiaria* are closely related genera. *Urochloa* has an inflorescence that is a panicle of unilateral primary branches, spikelets in which the first glume is facing away from the primary branch (Fig. 1D), and usually has a mucronate to awn tipped upper lemma (Fig. 2C). *Brachiaria* also has an inflorescence that is a panicle of unilateral primary branches, but in some taxa there can be some rebranching of the primary branches. The spikelets are oriented so that the first glume is facing towards the primary branch (Fig. 1C) and the upper lemma is usually awnless, but occasionally mucronate. Traditionally these two genera are separated by the orientation of the spikelets. Using this criteria to delimit the genera, *Panicum reptans* L. is recognized in *Urochloa*, and not in *Panicum* nor *Brachiaria*. Spikelet orientation can be difficult to determine, especially if the spikelets are on long pedicels. Gardner and Hubbard (1938) suggested examining the spikelet just below the terminal one on a primary branch. This spikelet is generally short-pedicellate and appressed to the primary branch. Spikelet orientation is easily determined when the branches are in the sheath or just after exertion.

Since, *Urochloa* has not previously been treated in a Texas manual, a key is needed to distinguish it from other related genera of the Paniceae tribe. A key to the genera of Paniceae with unbranched primary branches is provided. Sometimes there can be some rebranching at the base of the primary branch.

KEY TO THE GENERA OF TEXAS PANICEAE WITH PANICLES  
OF UNBRANCHED PRIMARY BRANCHES

- |       |                                                                                                                                          |                    |
|-------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1.    | Glumes awned .....                                                                                                                       | 2                  |
| 1.    | Glumes awnless or absent .....                                                                                                           | 3                  |
| 2(1). | First glume as long as second glume (excluding awns), first glume awn longer than the second glume awn; ligule a ciliate membrane .....  | <i>Oplismenus</i>  |
| 2.    | First glume shorter than second glume (excluding awns), first glume awnless or short awned; ligule absent or a stiff ring of hairs ..... | <i>Echinochloa</i> |
| 3(1). | First glume reduced to a cup-like or disc-like ring (Fig. 1-A) present at the base of the spikelet (pedicel resembling a golf tee) ..... | <i>Eriochloa</i>   |
| 3.    | First glume present or absent, if present, not forming a cup-like structure at the base of the spikelet .....                            | 4                  |

- 4(3). Lemma margins of upper floret membranous, white, flat, and not inrolling over the palea ..... *Digitaria*
4. Lemma margins of upper floret firm, not membranous, the same texture as back of lemma and margins inrolled over the palea ..... 5
- 5(4). First glumes absent ..... 6
5. First glumes present ..... 7
- 6(5). Second glume facing away from primary branch (Fig. 1-C); primary branch three angled ..... *Axonopus*
6. Second glume facing towards (lying against) primary branch (Fig. 1-D); the primary branch not three-angled, but flattened ..... *Paspalum*
- 7(5). Lemma of upper floret smooth and shiny ..... 8
7. Lemma of upper floret roughened, usually transversely roughened, not smooth; dull or shiny ..... 14
- 8(7). Ligule absent ..... *Echinochloa*
8. Ligule present ..... 9
- 9(8). Spikelets awned ..... *Echinochloa*
9. Spikelets awnless ..... 10
- 10(9). Primary branch extends past the terminal spikelet as a point or bristle (rarely with a reduced spikelet on the point or bristle) ..... *Paspalidium*
10. Primary branch not extending past the terminal spikelet as a point or bristle ..... 11
- 11(10). First glume not present on all spikelets ..... *Paspalum*
11. First glume present on all spikelets ..... 12
- 12(11). First glumes consistently 1/2 to as long as the spikelet ..... *Panicum*
12. First glumes consistently less than 1/2 as long as the spikelet or variable in length, some are less than 1/2, and some are more than 1/2 as long as the spikelet ..... 13
- 13(12). First glume conspicuously 3–5 veined and distinctly clasping the spikelet; palea, of upper floret, apex narrowly acute ..... *Panicum*
13. First glume 0–1 veined and not clasping the spikelet; palea, of upper floret, apex blunt to rounded ..... *Paspalum*
- 14(7). First glume facing towards the primary branch (Fig. 1-C) ..... *Brachiaria*
14. First glume facing away from the primary branch (Fig. 1-D) ..... 15
- 15(14). Primary branch extends past the terminal spikelet as a point or bristle (rarely with a reduced spikelet on the point or bristle) ..... *Paspalidium*
15. Primary branch not extending past the terminal spikelet as a point or bristle ..... 16
- 16(15). Lemma of uppermost floret with a mucronate or awned apex; plants annual or perennial ..... *Urochloa*
16. Lemma of uppermost floret awnless, apex acute to rounded; plants perennial ..... *Paspalum*

KEY TO THE TEXAS SPECIES OF *UROCHLOA*

1. Spikelets 1.8–2.2 mm long ..... *U. reptans*
1. Spikelets 2.5–5.5 mm ..... 2
- 2(1). First glume more than 2/3 (rarely 1/2) as long as spikelet; 1–3 conspicuous trichomes on the upper 1/2 of the first glume; first glume 3-veined; perennial ..... *U. mosambicensis*
2. First glume up to 1/2 as long as spikelet; without conspicuous trichomes on first glume; first glume 3–5 veined; annual ..... *U. panicoides*

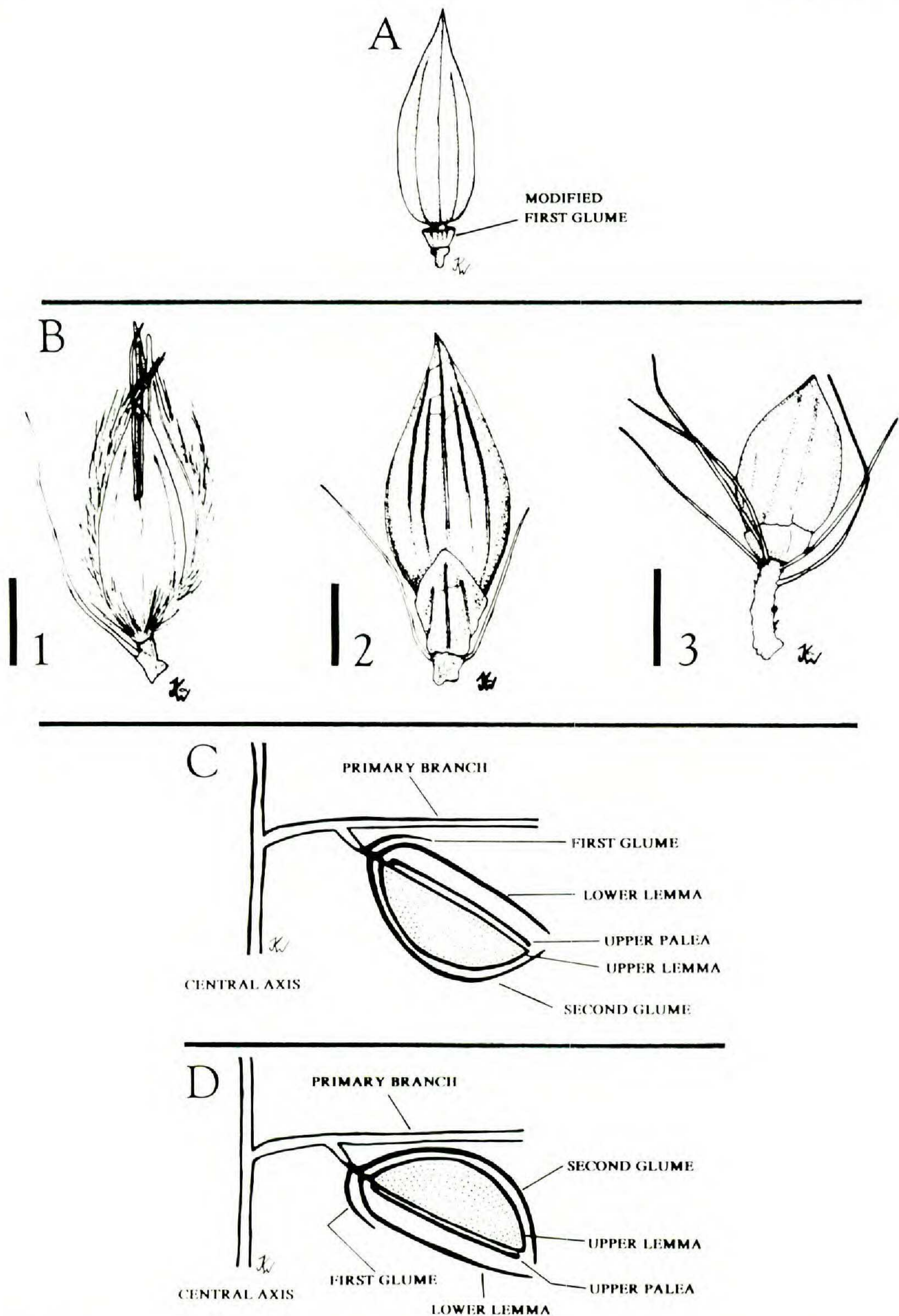


FIG. 1. (A): Illustration of an *Eriochloa* spikelet showing the modified first glume; (B): Spikelets of the three *Urochloa* species in Texas, showing the first glume. Bar equals 1 mm.: (1) *U. mosambicensis* spikelet; (2) *U. panicoides* spikelet; (3) *U. reptans* spikelet. (C): Diagrammatic illustration of the spikelet orientation on the primary branch. The second glume is facing away from the branch and the first glume is lying against the branch. (D): Diagrammatic illustration of the spikelet orientation on the primary branch. The second glume is lying against the branch and the first glume is facing away from the branch.

***Urochloa mosambicensis*** (Hackel) Dandy, J. Bot. Brit. & For. 69:54. 1931. (Fig. 1-B1). TYPE: AFRICA. Mozambique, *de Carvalho* (ISOTYPE: K [Clayton and Renvoize 1982]). *Panicum mosambicense* Hackel, Bol. Soc. Brot. 6:140. 1888.

*Urochloa pullulans* Stapf, Flora of Tropical Africa 9:590. 1920. *nom. superfl.*, based on *Panicum mosambicense*.

*Urochloa rhodesiensis* Stent, Proc. Trans. Rhod. Sci. Ass. 32:26. 1933. TYPES: AFRICA. Zimbabwe: Nyamandhlovu, *Rattray 500 & Salisbury* (ISOSYNTYPE: K), *Stent* in S.R.G.H. 3669 (ISOSYNTYPE: K), *Stent 4516* (SYNTYPE: SRGH) and *Stent 5547* (ISOSYNTYPE: K) (Clayton and Renvoize 1982).

Perennial, caespitose or stoloniferous, usually rooting at the lower nodes. *Culms* 20–150 cm long; pubescent with papilla-based trichomes; nodes pubescent. *Leaves* cauline; *sheaths* shorter than internodes, basal sheaths silky pubescent, upper sheaths pubescent with papilla-based trichomes; *ligules* 1.0–2.0 mm long, a ciliate membrane; *blades* (1.3) 3.0–8.5 (30) cm long, (1.5) 3.0–7.0 (20) mm wide, flat, pubescent with scattered papilla-based trichomes; margins cartilaginous and antrorsely scaberulous. *Inflorescence* (3) 6.5–9.5 (12.5) cm long, a panicle of (2) 3–6 (15) spicate primary unilateral branches, central axis pubescent; *branches* (2) 3.0–6.0 (8) cm long, margins antrorsely scaberulous, 1 per node; branches ascending, appressed to central axis; branches terminated by spikelet. *Pedicels* 0.2–0.5 mm long, with 1–3 conspicuous trichomes to 5 mm long. *Spikelets* (3.0) 4.0–4.7 (5.0) mm long, oriented with the first glume away from the branch axis (Fig. 1-D), a tuft of trichomes at base of spikelet; *first glume* 2.8–3.3 mm long, (1/2) 2/3–3/4 the length of the spikelet, 3-veined, glabrous except for 1–3 conspicuous trichomes, 1.5–2.7 mm long, originating on or near the midvein in the upper 1/2 of the glume, apex erose, margins frequently purple tinged and antrorsely ciliolate; *second glume* (3.0) 4.0–4.7 (5.0) mm long, as long as the spikelet, 5-veined, pubescent, apex narrowly acuminate to an awn-like tip. *Lower floret* staminate; anthers 1.9–2.2 mm long, yellow; *lemma of lower (sterile) floret* 3.0–4.0 mm long, 5-veined, lateral veins adjacent to one another, sparsely pubescent on back, margins conspicuously pubescent in mid-section of lemma with long appressed trichomes to 2.1 mm long, trichomes white to purple tinged, apex narrowly acuminate to an awn-like tip; *palea* 3.0–3.5 mm long, membranous, apex cuspidate to narrowly acuminate; *lemma of upper (fertile) floret* 2.2–2.6 mm long, transversely rugose, apex rounded, awn-tipped; awn 0.5–0.7 (1.2) mm long, awn antrorsely puberulent; *palea* 2.1–2.3 mm long, apex rounded, longitudinally roughened. *Anthers* 1.4–1.5 mm long, yellow, 3 stamen.

Specimen Examined. TEXAS. Jim Wells Co.: 7C Ranch off county rd. 418. 26 Sep 1992, *Canales 9* (TAES). Associated species: *Bothriochloa barbinodis* (Lag.) Herter, *Hilaria belangeri* (Steud.) Nash, *Setaria macrostachya* Kunth in H.B.K., *Eragrostis secundiflora* Presl subsp. *oxylepis* (Torrey) S.D. Koch, *Pennisetum ciliare* (L.) Link var. *ciliare*, and *Chloris cucullata* Bischoff.

***Urochloa panicoides*** P. Beauvois, Ess. Agrost. 53, fig. 11(1). 1812. (Figs. 1-B2 and 2). TYPE: Mauritius, *de Jussieu* (whereabouts uncertain [Clayton and Renvoize, 1982]).

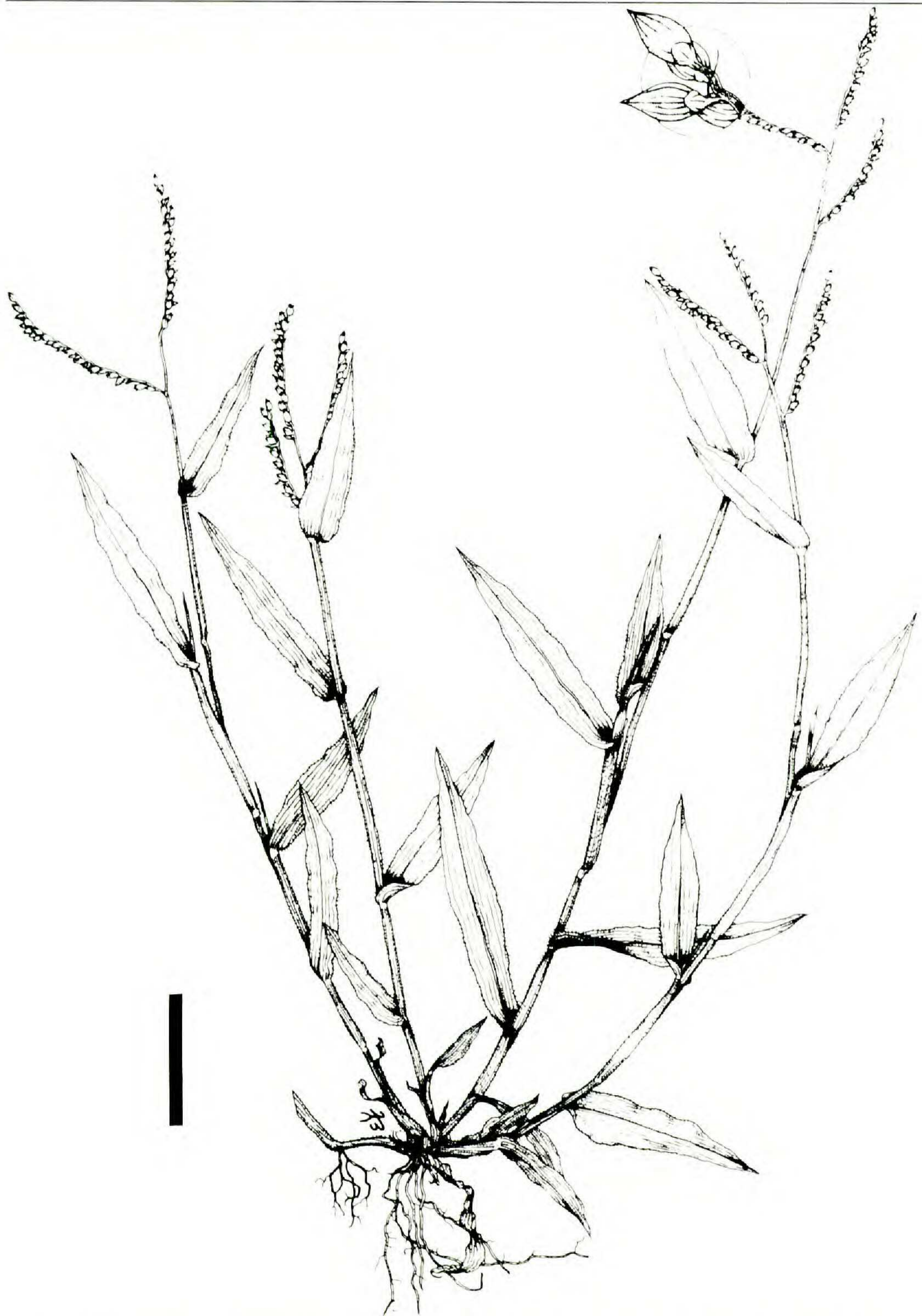


FIG. 2. Illustration of *Urochloa panicoides* P. Beauv.; bar equals 4 cm. (Drawn from: Wipff 2027, S. & G. Jones [TAES]).

LIVERSEED GRASS. Annual with ascending to prostrate-decumbent culms, usually rooting at lower nodes. *Culms* 5–90 cm long; glabrous to sparsely pubescent; nodes usually pubescent. *Leaves* cauline; *sheaths* 1/2 the length of the

internodes; pubescent, margins usually conspicuously pubescent, at least on one side; *ligules* 1–1.5 mm long, a ring of trichomes; *blades* (2) 5–10 (25) cm long, 5–14 (18) mm wide, flat, pubescent, with scattered papillose trichomes; margins undulate, with papilla based trichomes. *Inflorescence* 5–10 cm long, a panicle of 2–7 (10) spicate primary unilateral branches; *branches* (1) 2.5–6.0 (7) cm long, antrorsely scabrous, 1 (2) per node, lowermost branch spreading, uppermost branch ascending, terminated by spikelet. *Pedicels* 0.3–0.5 mm long, with 1–3 (5) trichomes to 5 mm long. *Spikelets* (2.5) 3.5–4.5 (5.5) mm long, oriented with the first glume away from the branch axis (Fig. 1-D); *first glume* 1.3–1.6 mm long, 3–5-veined, broadly triangular, approximately 1/4 the length of the second glume; *second glume* 3.8–4.3 (5.0) mm long, 9–11 (–13)-veined, ovate, glabrous; *lower floret* neuter; *lemma of lower (sterile) floret* 3.8–4.2 (5) mm long, 5 (–7)-veined, ovate, apex acute; *palea* nearly as long as lemma; *lemma of upper (fertile) floret* 2.8–3.5 mm long, transversely rugose, apex rounded, awn-tipped; awn (0.3) 0.6–1.0 mm long; *palea* nearly as long as lemma, apex rounded. *Anthers* 0.8–1.0 mm long, yellow, 3 stamen; *caryopsis* 2.0–2.5 mm long, ovate. *Flowering Period*: June–November (January). Adventive in lawns, playgrounds, along railroad tracks and roadsides, and other disturbed sites.

Specimens Examined. TEXAS. Calhoun Co.: 1.9 mi NE on TX Hwy 35 from its jct with the Guadalupe River (NE of Tivoli); open, disturbed roadside, 17 Oct 1991, *Wipff 2125 & S. & G. Jones* (TAES). Cameron Co.: 10 mi W of Port Isabel on Hwy 100, roadside near a culvert, 14 Oct 1984, *Lonard 5001* (PAUH, TAES). Hidalgo Co.: weedy lawn near a tennis court on the Edinburg High School campus, Edinburg, 12 Aug 1972, *Lonard 3109* (PAUH, TAES); weedy playground at Jefferson Elementary School, Edinburg, clay loam, 15 Sept 1984, *Lonard 4931*. Jim Wells Co.: ca. 150 m S on County Rd 339 (extension of FR 2044) from its jct with TX 44, SW of Agua Dulce, disturbed roadside between the ditch and adjacent mesquite thicket, 01 Jul 1992, *S. & G. Jones 9092* (BRIT/SMU, PAUH, TAES). Kleberg Co.: NW corner of US 77 and Caesar Ave., SE side of Kingsville, 14 Jan 1992, *S. & G. Jones 7871* (BRIT/SMU, PAUH, TAES). Maverick Co.: 100 m W on Hwy 277 from its jct with FR 1665 (E of Quemado); W side of Quemado Creek, open disturbed roadside, 15 Jun 1991, *Wipff 2027 & S. & G. Jones* (TAES). Nueces Co.: 100–150 m W on FR 70 from its jct with County Rd 63A (E of Bishop and S of Petronila), open disturbed roadside, 17 Oct 1991, *Wipff 2132 & S. & G. Jones* (TAES). Refugio Co.: SE side of Guadalupe River on TX Hwy 35 (NE of Tivoli), 100–200 m from Guadalupe River on SE side of Hwy, open disturbed roadside, 17 Oct 1991, *Wipff 2128 & S. & G. Jones* (TAES). San Patricio Co.: at the jct of US 77 (Voss St.) and the spur of the Southern Pacific and Missouri railroad, just SW of Humphries Street in Odem, 14 Jan 1992, *S. & G. Jones 7872* (PAUH, SAT, SWT, TAES).

A survey for *U. panicoides* was conducted by Larry Fowler, Ruben Garcia, and Darell Belcher from the USDA-APHIS-PPQ, during the period from 20 August to 16 September 1991, which resulted in the location of this species in Cameron, Hidalgo, Willacy, and Zapata Counties. Larry Fowler (pers. comm.) also reported a collection from Starr County.

***Urochloa reptans* (L.) Stapf**, *Flora of Tropical Africa* 9:601. 1920. (Fig. 1-B3).

TYPE: Jamaica, *Browne* (HOLOTYPE: LINN, Clayton and Renvoize 1982). *Panicum reptans* L.,

Syst. Nat. ed. 10, 2:870. 1759. *Brachiaria reptans* (L.) Gardner & C.E. Hubbard in Hook, Ic. Pl. 34, t.3363. 1938.

Annual, mat forming, rooting at the nodes. *Culms* 10–35 cm tall, prostrate, upper culms becoming erect, branching extensively, glabrous; nodes glabrous to sparsely pubescent; *leaves* cauline. *Sheaths* keeled, as long as the internodes, glabrous, margins densely pubescent. *Ligules* a ring of trichomes, to 1.5 mm long. *Blades* 2.0–5.5 cm long, 5–10 mm wide, flat, usually undulate margins, midrib indistinct, glabrous above with a few scattered trichomes below, margins antrorsely scabrous with regularly spaced papilla based trichomes. *Inflorescence* 1.5–6 cm long, 4–5 cm wide, a panicle with unilateral primary branches; primary branches unbranched, occasionally rebranched at base of branches; *branches* 1.0–4.0 cm long, 4–10(16) branches, ascending to spreading, 1–2 per node; spikelets single or paired, if paired, one of the pair on a longer pedicel, *pedicels* 0.1–1.3 mm long, with 3–5 scattered trichomes. *Spikelets* 1.8–2.2 mm long, ovate, oriented with the first glume away from the branch axis (Fig. 1-D); *first glume* 0.2–0.5 mm long, 0–3 veined; *second glume* 1.8–2.0 mm long, 7-veined, glabrous; *lower floret* neuter or staminate; *lemma of lower (sterile) floret* 1.7–2.0 mm long, 5-veined, glabrous; *palea* 1.5–1.8 mm long, membranous; *lemma of upper (fertile) floret* 1.5–1.7 mm long, indistinctly veined, rugose, glabrous, apex rounded and mucronate, mucro 0.1 mm long; *palea* 1.5–1.6 mm long, rugose. *Anthers* (0.5) 0.6–1.1 mm long, stamens 3; *caryopsis* 0.8–1.2 mm long. *Flowering Period*: mainly August through October, but known to flower as early as May. *Distribution*: Region 1 (Pineywoods), region 2 (Gulf Prairies and Marshes), and region 6 (South Texas Plains) as defined by Hatch et al. (1990). Along roadside and on other disturbed sites.

#### ACKNOWLEDGMENTS

We would like to thank Larry Fowler (USDA-APHIS-PPQ, Brownsville) for his review and assistance on this manuscript, and Keith Westover for the illustration of the plant habit of *Urochloa panicoides*. The other illustrations were drawn by the senior author. This is Technical Bulletin TA-30814, Texas Agricultural Experiment Station.

#### REFERENCES

- CHASE, A. 1951. Hitchcock's manual of the grasses of the United States, 2nd ed., U.S.D.A. Misc. Publ. No. 200. U. S. Government Printing Office, Washington D.C.
- CLAYTON, W.D. and S.A. RENVOIZE. 1982. Flora of Tropical East Africa: Gramineae, Part 3. R.M. Polhill, Ed. A.A. Balkema, Rotterdam.
- \_\_\_\_\_. 1986. Genera graminum, grasses of the world. Kew Bull. Addit. Ser. XIII. Her Majesty's Stationary Office, London.
- CORRELL, D.S. and M.C. JOHNSTON. 1970. Manual of the vascular plants of Texas. Texas Research Foundation, Renner, TX.



- GARDNER C.A. and C.E. HUBBARD. 1938. *Brachiaria occidentalis* Gardner et C.E. Hubbard. In J.W. Hooker's, *Icones Plantarum*, plate 3363. London. pl. 3301–3400.
- GOULD, F.W. 1975. *The grasses of Texas*. Texas A&M Univ. Press, College Station, TX.
- HATCH, S.L. 1977. New grass distribution records for New Mexico and the United States. *Great Basin Nat.* 37(4): 530–531.
- HATCH, S.L., K.N. GHANDI, and L.E. BROWN. 1990. Checklist of the vascular plants of Texas. *Tex. Agric. Exp. Sta. Bull.* MP-1655, College Station, TX.
- JUDZWIEWICZ, E.J. 1990. *Flora of the Guianas, Series A: Phanerograms, Fascicle 8, No. 187 Gramineae (Poaceae)*, Ed. Görts-Van Rijn. Koeltz Scientific Books; Koenigstein, Germany.
- MCVAUGH, R. 1983. *Flora Nova-Galiciana: A descriptive account to the vascular plants of Western Mexico. Vol. 14. Gramineae*. The Univ. of Michigan Press, Ann Arbor, MI.
- POHL, R.W. 1980. *Flora Costaricensis: Family #15, Gramineae*. W. Burger, Ed., Field Museum of Natural History, Chicago, IL.
- WEBSTER, R.D. 1987. *The Australian Paniceae (Poaceae)*. J. Cramer, Berlin, Germany.